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throughout the land not because of the belief that boiled water prevented disease and tea leaves modified the insipid taste of the boiled water, but because the infusion of the tea leaves *per se* was looked upon as a medicine specific for the prevention of the prevalent diseases.

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SCIENTIFIC BOOKS

Applied Psychology. By H. L. HOLLINGWORTH and A. T. POFFENBERGER. D. Appleton and Co., New York, 1917. Pp. xiii + 337.

This book will properly attract many readers who wish to know the significance of the practical movement in psychology. As the first text-book in applied psychology it gives a well-balanced presentation of the aims, methods and scope of this new "type of interest and pursuit." Nowhere else have the results and methods of approach for practical problems been so completely assembled and so well guarded from misuse. Although it does not reach the dignity of a treatise on applied psychology, this admirable book by two members of the department of psychology at Columbia University will be appreciated both by general readers and by those psychologists who wish to vitalize their introductory courses by associating them with student interests. Only a few colleges as yet have offered a course which attempts to cover the broad field of applied psychology, but within a year a professorship in applied psychology has been established, the *Journal of Applied Psychology* started, and a Division of Applied Psychology under that title organized in an institute of technology. Whether a unit of instruction entitled applied psychology touches too varied interests and affords too meager content will doubtless continue for some time to be a question for each college to decide. It is certainly too early to expect a text to take the place of a teacher.

Besides bringing the results of many scattered researches together, the authors have helped to organize this branch of psychology

by carefully distinguishing and illustrating three main forms of application to practical problems. These three forms include psychological analysis of a situation, carrying over of principles worked out in allied researches, and the adaptation and improvement of technique. With this scientific procedure in the foreground, they have avoided the unpleasant effect on the student of either a very limited technical monograph or of the magazine literature of the prophetic promoter. The first portion of the book summarizes in compact and usable form the psychological work which helps to understand general human efficiency and how to increase it. It includes the influences of heredity, sex and maturity, environmental factors like illumination and ventilation, the principles derived from the studies of the learning process, the effects of work and rest, stimulants, etc. The second half of the book sets forth the psychological procedure in those fields of occupational activity in which the applications have been most explicit. These include employment management, the industrial workshop, advertising and salesmanship, law, social work, medicine and education.

The task of guarding the foundations of the new division of their science has not been assumed lightly by the authors. Instead of the usual illustrations from individual cases, which may or may not be exceptions, we find the constant citation of experiments bearing upon a problem with a careful discussion of the sources of error and the dangers of generalization from the particular investigation. Instead of mere psychologizing about work methods we now have much emphasis on the technique under which the conclusions were reached. The teacher of the consulting psychologist must evidently train him in technical methods of research and the interpretation of results. The authors look forward to that day when the engineering type of psychotechnical expert will meet with other specialists to co-operatively attack their joint problems, instead of the make-shift procedure under which the specialist in business, medicine, education, etc., attempts to dabble in psychology or the psychologist to dabble in other specialties.

To those who studied their psychology with the introspectionist school it must be strange to find brought together under a psychological heading, the work of the physiologist on drugs and fatigue, of the engineer on motion-study, of the biologist on heredity, of the psychiatrist on mental abnormality, of the clinician on mental development, and of the educator on learning, in addition to the research of the psychologists. It marks the change in psychology to the more objective study of behavior. Applied psychology rejoices that it affords a clearing house for any knowledge which bears directly upon the understanding and control of human action.

The authors cite telling examples in which scientific studies of the human factor have produced better results than the hit-or-miss methods of practical sense in dealing with business, industrial, and professional problems. In many other cases than industrial accidents it will doubtless be found that the most important cause to be controlled is not in the field of the applied physicist but in the field of human engineering. In leaving the book, if the reader still feels that we are yet only on the threshold of a new pursuit, he will at least have found abundant evidence scientifically formulated to convince him that we are on the threshold and not merely viewing the house at a distance.

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SPECIAL ARTICLES

NOTE ON THREE DEVICES FOR USE IN ELECTROMETRY

DURING recent work with an electrometer the author has employed three devices which are obvious enough and can hardly be novel, but which seem worth putting more definitely on record as tested devices.

(1) A simple means of increasing the deflections of an electrometer is often wanted under circumstances where the use of a sufficiently long distance from mirror to scale is inconvenient. This may be accomplished by interposing a concave lens between mirror and scale, thus magnifying the deflection. A lens of rather long focus placed, if anything

nearer the mirror (fig. 1) is preferable, as the effects of chromatic aberration are thereby diminished and the proportionality of the deflections is also better preserved. The image will be much brighter if a *cylindrical* lens is used; such a lens can be secured quickly and at small expense as a special order from Bausch & Lomb.

By this means a Dolezalek electrometer with platinum fiber was raised from 3,000 to 18,000 mm. per volt at a scale distance of 4 m. Owing to diffraction, the spot was about 1 mm. wide, but its position could be read to 0.2 mm., and the proportionality between deflection and potential was very good.

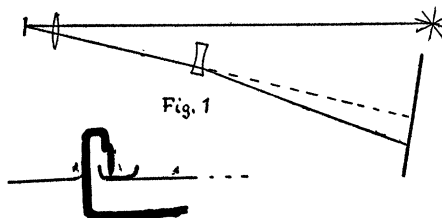


Fig. 2

(2) Sometimes one wants a simple means of connecting two wires together which will permit of easier disconnection than a soldered joint and yet will not introduce the additional capacity and possible leakage of a key. For this purpose one may solder a little silver cup to one wire and then attach the other wire to a piece of heavy wire tipped with a silver point and bent so that the point rests upon the floor of the cup (fig. 2). Silver oxide being a fairly good conductor, the slight pressure thus obtained is quite sufficient to make good contact.

(3) To obtain time signals at rather long intervals a torsion pendulum is more useful than a gravity pendulum because of the ease with which the period may be varied over a wide range. If the inertia system consists of a light cross-rod carrying two heavy sliding weights, then the period is approximately proportional to the distance of the weights from the center, so that a range of 1 to 10 in the period is easily obtained. The system can be